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Pesticide Fact Sheet Number 141: Dalapon

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

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Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Dalapon
Reason for Issuance: Registration Standard
Date Issued: July 31, 1987
Fact Sheet Number: 141

DESCRIPTION OF CHEMICAL

Dalapon (free acid)
- Chemical Name: 2,2-dichloropropionic acid
- CAS Registry No.: 75-99-0
- Shaughnessy No.: 28901

Dalapon Sodium Salt
- Chemical Name: sodium 2,2-dichloropropionate
- CAS Registry No.: 127-20-8
- Shaughnessy No.: 28902

Dalapon Magnesium Salt
- Chemical Name: magnesium 2,2-dichloropropionate
- CAS Registry No.: N/A
- Shaughnessy No.: 28903

Year of Initial Registration: 1969

Trade Names: 2,2-dichloropropanoic acid, sodium and magnesium 2,2-dichloropropanoate, Basfapon, Basfapon B, Basfapon N, Dalapon 85, dalapon magnesium, Dalapon-Na, dalapon sodium, Ded-Weed, Devipon, Dowpon M, DM Dalapon, DPA (JMAF), Gramevin, magnesium dalapon, magnesium salt of dalapon, proprop, Radapon, Revenge, sodium dalapon, and sodium salt of dalapon.

Pesticide Type: Herbicide

U.S. and Foreign Producers: Dow Chemical Company; BASF Aktiengesellschaft; Crystal Chemical Inter-America; SDS Biotech Corp.; Sintesul; and Vertec Chemical Corp.

USE PATTERNS AND FORMULATIONS

Application Sites: Terrestrial, food crops (root and tuber and legume vegetables; citrus, pome, stone and small fruits; tree nuts; cereal grains, coffee beans; sugarcane; birds-foot trefoil); terrestrial, nonfood crops (fallowland; pastureland; rangeland; noncrop areas; ornamental grasses, shrubs and trees); aquatic, food crop (taro paddy banks);

aquatic nonfood sites (drainage ditches; industrial waste disposal systems, irrigation ditchbanks); forestry (forest seedlings).

Predominant Uses: Primarily an industrial/noncrop herbicide (70 percent); agricultural use (30 percent) primarily on sugarcane and potatoes.

Types and Methods of Application: Conventional aerial or ground equipment as fall or spring preplant, preemergence, or post-emergence application, depending on the crop or site situation.

Application Rates: 0.075 lb active ingredient (ai) per 5,000 square feet to 25.5 lb ai per acre (A) for industrial/non-crop use; 0.12-17 lb ai/A for food uses.

Types of Formulations: Wettable powder, soluble concentrate/ solid, impregnated materials, granular and technical.

Usual Carriers: Water

SCIENCE FINDINGS

Summary Science Statement: Available data are insufficient to assess the toxicological effects of dalapon. Only one acceptable oncogenicity study is available and complete evaluation of this study is not possible without historical control data. This study did show an increased incidence of benign lung tumors.

There are no acceptable environmental fate studies. Preliminary data, however, do indicate there may be a potential for groundwater contamination.

There are insufficient data available to fully assess ecological effects from the use of dalapon. However, there is a threat to endangered plants based on the use pattern of dalapon.

Chemical Characteristics: Product chemistry data are unacceptable, except dissociation constant as noted below, and are required.

Dissociation constant
(magnesium salt) = pka = 1.84 at 0.05M

Toxicology Characteristics: While published registrant data indicate low toxicity, the Agency has only limited toxicological data on dalapon as discussed below:

In an acceptable two-year oncogenicity study, mice were fed doses of 0, 2, 60 and 200 mg/kg/day. All doses (2, 60 and 200 mg/kg/day) showed a doubling of the incidence of benign lung tumors in the male mice compared with controls. Historical control data are needed to allow final evaluation of the study.

A supplementary study is available on the teratogenic potential of dalapon in the rat. No teratogenic response was reported. However, a NOEL for fetal and maternal toxicity was not determined.

Physiological and Behavioral Characteristics:

Foliar Absorption: Dalapon is absorbed by roots and leaves but is easily washed off the foliage.

Translocation: Dalapon translocates readily throughout the plant and accumulates in young tissue; it is not degraded in plants.

Mechanism of Pesticide Action: The mode of action of dalapon involves interference of meristematic activity in root tips and apical meristems, reduction of wax formation on leaf surfaces, and alteration of cell membranes.

Environmental Characteristics: There are no acceptable studies to assess the environmental fate of dalapon. Supplementary data do indicate that there may be a potential for groundwater contamination because dalapon appears to be highly soluble in water, to leach readily and to be moderately persistent. Dalapon has been designated as one of the pesticides for analysis in the National Pesticides in Well Water Survey.

Ecological Characteristics:

Avian Dietary Toxicity -	Japanese quail	=	> 5000 ppm
	Ring-necked pheasant	=	> 5000 ppm
	Mallard duck	=	> 5000 ppm
Freshwater Fish Toxicity -	Bluegill	=	105 ppm
Aquatic Invertebrates Toxicity -	Daphnia pulex	=	11 ppm

Potential Problems Related to Endangered Species: The Office of Endangered Species has issued a jeopardy opinion which indicates that several plant species could be in jeopardy if herbicides are used within or adjacent to their habitat. This opinion applies to dalapon's registered forest uses.

Tolerance Assessment: Tolerances have been established for residues of dalapon in a variety of raw agricultural commodities and meat byproducts (40 CFR 180.150(a)(b)) and in processed food (21 CFR 193.105) and feed (21 CFR 561.110).

The toxicology data for dalapon are insufficient to determine an Acceptable Daily Intake (ADI). Prior to reevaluation of dalapon, an ADI of 0.08 mg/kg/day was considered appropriate based on a NOEL of 8 mg/kg/day from a 2-year rat study and an uncertainty factor of 100. This study

has since been determined to be unacceptable. However, until such time as data are available and an ADI can be established, the rat study will be used to determine a provisional ADI (PADI). Because of the study's deficiencies, an uncertainly factor of 1000 was used to arrive at a PADI of 0.008 mg/kg/day. Comparing the percent of crop treated to the PADI results in a Theoretical Maximum Residue Contribution (TMRC) for the U.S. population of 0.00036 mg/kg/day. The TMRC occupies 4.5 percent of the PADI.

Pesticide Incident Monitoring System (PIMS): PIMS files contain 22 incident reports involving dalapon, nine of which involved dalapon in combination with other ingredients. Twelve were related to agricultural use. Equipment failure occurred in four of the incidents. Fifteen of the incidents involved exposure to humans; while medical treatment was administered in 14 of these incidents, none required hospitalization.

SUMMARY OF REGULATORY POSITION AND RATIONALE

Summary of Agency Position: The Agency is requiring registrants of dalapon to submit additional data as identified in the Registration Standard and summarized in the following section. The Agency will not establish any new food use or register any significant new uses until adequate data are available to fully assess dalapon.

Unique Warning Statements Required on Labels: Unique labeling is not imposed in the Registration Standard. Endangered species labeling, however, is required for forest uses. This labeling is addressed in Pesticide Registration Notice (PR) 87-4 dated May 1, 1987.

SUMMARY OF MAJOR DATA GAPS

Data	Due Date (From Issuance of Standard)
Product Chemistry	6-12 months
Residue Chemistry	15-18 months
Environmental Fate	9-39 months
Toxicology	9-50 months
Ecological Effects	9-12 months

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